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HVR-1500A

HDV Studio Recorder with HD-SDI input

The HVR-1500A is an HDV source feeder/ recorder*1 positioned at the top of Sony's HDV Series.

Inheriting the design concept of the market-acclaimed DSR-1500AP, the HVR-1500A offers the same convenient features that professional users demand, such as quick mechanical response, multi-format DV playback and a rich set of professional video/audio interfaces ranging from analogue to digital SDI and AES/ EBU.

The HVR-1500A also offers HD-SDI input/output and RS-422A control capabilities, bridging HDV source footage and assets with high-end HD formats and HD editing equipment. In addition, with the optional HVBK-1520 board installed, the HVR-1500A has a range of conversion capabilities that allow DV recordings to be up-converted to 1080i or 720P signals, and 1080i HDV recordings to be cross-converted to 720P signals. This allows operators to integrate DV and HDV source footage and assets into the same HD editing system, giving them the flexibility to choose between either a 1080i or a 720P system.

The HVR-1500A can also be used as a standard definition DVCAM recorder, in which case the same editing features as the DSR-1500AP are offered.

The HVR-1500A is certainly the HDV recorder of choice for environments where robustness and functionality are prime concerns.

*1 In HDV mode, editing capabilities are not available.

Features

HDV 1080i Specification

The HDV 1080i specification* for the HDV format features 1,080 effective scanning lines (interlace scanning system) and 1,440 horizontal pixels. It adopts the MPEG-2 compression format (MP@ H-14 for video),which uses 8-bit digital component recording with a sampling rate of 4:2:0. MPEG-1 Audio Layer II is used as the audio compression format, allowing for two-channel recording with a sampling frequency of 48 kHz/16-bit. The HDV 1080i specification provides the high picture quality required for HDTV programme production.

*The HDV format also defines the HDV 720p specification,which features 720 effective scanning lines (progressive scanning system) and 1,280 horizontal pixels.

The Right Media for Optimum HDV Content

As a member of the proven DV family of formats, the HDV format was developed from the outset to be compatible with all grades of DV videocassette tape. The Digital Master Tape has been designed and tested with HDV VTRs for outstanding performance. It is an ideal and reliable choice for affordable HD productions across a wide variety of environments.

Switchable Recording: HDV 1080i/DVCAM/DV and 60i/50i

The HVR-1500A can be switched between HDV 1080i*, DVCAM and DV (SP)** recording modes, providing full flexibility to record in either standard definition or high definition depending on your production needs. In addition, it can be switched between 50i and 60i systems, eliminating the need for two separate VTRs, one for each standard.

* In HDV mode, editing capabilities are not available.
** The HVR-1500A supports DV (SP) mode only; DV (LP) mode is not available. Assemble or insert editing is not supported in DV (SP) mode.

Playback Compatibility with DV (25 Mb/s) Family Formats

For operational versatility, the HVR-1500A is designed to play back DV (25 Mb/s) family format recorded tapes without a mechanical adaptor and without having to switch playback modes on the menu. DVCPROâ¿¢ 25 recorded tapes (M-size cassettes) can also be played back.

Long Recording Time

The HDV format adopts the same track pitch and tape speed as the DV format, thus offering the same recording time - a maximum of 276 minutes when recording on a PHDV-276DM DigitalMaster standard cassette tape and 63 minutes when recording on a PHDVM-63DM DigitalMaster mini cassette tape. The DVCAM format adopts a wider track pitch than the

HDV/DV format (15 Î¼m compared to 10 Î¼m), and offers a maximum recording time of 184 minutes on a PDV-184N standard cassette tape and 40 minutes on a PDVM-40N mini cassette tape.

Up-conversion Capability

With the optional HVBK-1520 Format Converter Board installed, the HVR-1500A has an up-conversion capability that allows DV recordings and SD signals* fed to the HVR-1500A to be converted to 1080i or 720P signals and then output** from the HD-SDI interface. This allows DV recordings to be integrated into existing HD editing systems that support the 1080i or 720P format.

When up-converting the DV recording, the aspect ratio displayed can be converted from 4:3 to 16:9. Display modes can be selected from Squeeze, Edge Crop, or Letterbox.

* DV signals fed to the HVR-1500A's i.LINK interface cannot be up-converted and output from the HD-SDI interface.
** There may be a delay of one frame in outputting up-converted signals from the HD-SDI interface.

Cross-conversion Capability

With the optional HVBK-1520 Format Converter Board installed, the HVR-1500A has a cross-conversion capability that allows 1080i recordings to be converted to 720P signals, as well as 720/30P (29.97 frames/s) recordings to be converted to 1080/60i (59.94 fields/s) signals.

These signals are output* from the HD-SDI interface. This allows source footage and assets in different HDV formats to be integrated into the same HD editing system.

* There may be a delay of one frame in outputting cross-converted signals from the HD-SDI interface.

Down-conversion Capability

The HVR-1500A has a built-in down-conversion capability that allows 1080i recordings to be output as 480i and 576i signals from the i.LINK and SD-SDI interfaces. These signals can also be output from the analogue component, composite, or S-Video connectors. This allows 1080i recordings to be edited using non-linear editing systems running DV editing software or to be viewed on an SD monitor. When down-converting the 1080i recording, the aspect ratio displayed can be converted from 16:9 to 4:3. Display modes can be selected from Squeeze, Letterbox, or Edge crop.

HD-SDI Interface

The HVR-1500A provides HD-SDI input/output capability. 1080/60i (59.94 fields/s) or 1080/50i HD-SDI signal can be input in real time and these HDV recordings can be output in normal playback and search modes.

Analogue component or analogue composite signals that are down-converted from 1080i HDV recordings can also be output from the HD-SDI interface. 720/60P (59.94 frames/s) and 720/50P signals that are up-converted from DV recordings or cross-converted from 1080i HDV recordings can also be output from the HD-SDI interface in normal playback and search modes. Time code and audio signals are embedded in this HD-SDI signal. This interface allows operators to record programmes directly from HD-SDI-based editing systems such as the HDCAM and XDCAM HD systems.

The HVR-1500A can be utilized as a recorder that receives signals from a remote camera such as BRC Series camera. This interface also allows operators to integrate HDV footage and assets easily into existing HD-SDI-based editing systems.

SD-SDI Interface

The HVR-1500A also provides SD-SDI input*/output capability. Time code and audio signals are embedded in the SDI signal. This allows the HVR-1500A to connect with a wide variety of digital equipment including SDI-based editing systems.

* SD-SDI signals fed to the HVR-1500A's SD-SDI interface cannot be up-converted to HDV signals for recording to tape or to HD-SDI signals for output from the HD-SDI interface.

AES/EBU Interface

For professional digital audio needs, the HVR-1500A offers AES/EBU digital audio inputs/outputs.

i.LINK Interface

The HVR-1500A is equipped with a 6-pin i.LINK* ** interface. This allows it to transfer digital video, audio and command signals (in HDV, DVCAM, and DV format) to a compatible VTR or non-linear editing system via just a single cable.

* i.LINK is a trademark of Sony used only to designate that a product contains an IEEE 1394 connector. Not all products with an i.LINK connector will necessarily communicate with each other. For information on compatibility, operating conditions and proper connection, please refer to the documentation supplied with any device with an i.LINK connector. For information on devices that include an i.LINK connection, please contact Sony's local office.

** DVCAM/DV signals fed to the HVR-1500A's i.LINK interface cannot be up-converted to HDV signals for recording to tape or to HD-SDI signals for output from the HD-SDI interface.

Analogue Interfaces

As standard, the HVR-1500A provides analogue output interfaces for video and audio. These include composite, component and S-Video (Y/C) outputs and two channels of audio output (via XLR connectors).

Using these interfaces, the HVR-1500A can act as a source feeder for an analogue editing system and as a

simple playback viewer in various applications such as broadcast studios, OB vehicles and production offices. By installing the optional HVBK-1505 Analogue Input Board, a full range of analogue video and audio inputs also become available, allowing a smooth transition to digital systems.

Quick Response Mechanism

Quick mechanical response is an essential requirement for professional video production. The HVR-1500A provides this feature by using a reliable direct reel and drum motor mechanism.

Fast forward and rewind speeds are an impressive 85 times normal play speed. In HDV mode, the colour picture search* speeds are ±8 and ±24 times normal play speed and in DVCAM mode they are between -60 and +60 times normal play speed. In editing environments, where speed and time are critical, this mechanism reduces the frustration editors often feel when they are searching for specific scenes.

* The colour picture search function can be controlled through the RS-422A interface.

Tape and Head Cleaner for Reliable Operation

The HVR-1500A incorporates a tape cleaner that adopts a high-grade sapphire blade. This tape cleaner helps prevent signal dropouts by cleaning away particles that accumulate while the tape is running.

The recorder also incorporates a head cleaner to maintain the performance of the drum heads. These cleaners improve the reliability of recording and playback.

Built-in 2.7-inch LCD Monitor

The HVR-1500A is equipped with a 2.7-inch* colour LCD monitor with a high resolution of 211 K dots. This allows operators to view the input source during recording and check the playback picture in a 16:9 widescreen aspect ratio. It can also display the 4-channel audio level meters and time code, as well as setup menus for video, audio and VTR settings. Three different display modes can be selected.

*Viewable area, measured diagonally.

Auto Repeat

The HVR-1500A has a convenient auto repeat function. This enables the VTR to automatically rewind the tape to either the beginning of the tape or to a user-defined index point and to start playback again from there. Repeat start and stop index points can also be defined by setting time code values.

Assign Button

Functions frequently used for VTR operations can be assigned to an ASSIGN button located on the front panel of the HVR-1500A.

Digital Slow Motion and Jog Sound (in DVCAM mode)

When used with an editing controller, such as Sony's RM-280 Edit Controller, the HVR-1500A can provide excellent digital slow motion and jog sound for DVCAM recordings. It offers variable speed playback within the range of -0.5 to +0.5 times normal play speed. This allows operators to locate editing points quickly and accurately using noiseless slow-motion playback pictures.

Picture Search (in HDV mode)

With an editing controller, such as Sony's RM-280 Edit Controller, the HVR-1500A provides a convenient colour picture search function for HDV recordings.* [br][br]* In HDV mode, audio jog search is not supported and video jog search is supported in forward mode only.

Picture Search Using Menu Keys

The HVR-1500A provides a picture search function via the menu keys on its front panel. By pressing the forward arrow/ B and back arrow/ A buttons, forward and reverse search of 8 and 10 times normal play speed is available in HDV and DVCAM/DV modes, respectively. The up arrow and down arrow buttons allow frame-by-frame picture search, as well as slow-motion playback.

Audio Level Control

Audio levels can be adjusted via the control knobs on the front panel. In recording mode, the input audio level of the analogue XLR, SD-SDI, AES/EBU and i.LINK*14 interfaces can be adjusted. [br][br]In playback mode, the analogue XLR, SD-SDI, HD-SDI, AES/EBU and i.LINK* output audio levels can be controlled. [br][br]* In HDV mode, the input/output audio levels cannot be adjusted.

RS-422A Control

The HVR-1500A is equipped with an RS-422A interface, which is the industry standard for professional editing. This allows the VTR to interface with other VTRs from Sony, editing controllers such as Sony's RM-280 Edit Controller and non-linear editing systems. The RS-422A offers frame-accurate insert and assemble editing in DVCAM mode. It can also be used for source feeding* in HDV mode. [br][br]* The availability of frame-accurate control is dependent on the connected editing controller. For information on compatible editing controllers, please contact Sony's local office.

HD and SD Reference Inputs

The HVR-1500A accepts both HD and SD reference signals. The HVR-1500A has a time code input/output capability to synchronise time code when making tape copies.

Built-in Signal Generator

Equipped with a built-in signal generator, the HVR-1500A can generate colour bars or black burst for video and a 1-kHz tone or silent signal for audio. These signals can be recorded to tape when the

HVR-1500A is operating in DVCAM or DV mode* to create a pre-striped tape prior to editing. They can also be output from the analogue and digital interfaces to adjust other equipment in the system. [br][br]* Recording these signals to tapes in the HDV format is not available.

Technical Specifications

--Recording/ playback performance--	
Playback & down conversion format	60i system: 1080/60i*1, 480/60i*1 (NTSC) 50i system: 1080/50i, 576/50i (PAL)
Tape speed	HDV/DV SP: 60i system: 18.812 mm/s 50i system: 18.831 mm/s DVCAM 60i system: 28.193 mm/s 50i system: 28.221 mm/s
Playback/recording time	HDV/DV SP: Max. 276 min with PHDV-276DM cassette, Max. 63 min with PHDVM-63DM cassette DVCAMÂ Max. 184 min with PDV-184N cassette, Max. 40 min with PDVM-40N cassette
Fast forward/rewind time	Approx. 3 min with PHDV-276DM and PDV-184N cassette
Recording format	60i system: 1080/60i*1, 480/60i*1 (NTSC) 50i system: 1080/50i, 576/50i (PAL)

--Video Input--	
Digital video (BNC type x1)	HD-SDI: 60i system/50i system: SMPTE 292M compliant SD-SDI 60i system: Conforms to Serial Digital Interface (270Mb/s), SMPTE 259M 50i system: Conforms to Serial Digital Interface (270Mb/s), ITU-R BT. 656
Analog video	Ref. video (HD/SD) (BNC type x2, loop-through connection)*3 60i system: HD: bipolar tri-level sync, 0.3 Vp-p, 75 ohms , sync negative SD: black burst or composite sync, 0.286 Vp-p , 75 ohms , sync negative 50i system: HD: bipolar tri-level sync, 0.3 Vp-p, 75 ohms , sync negative SD: black burst or composite sync, 0.3 Vp-p , 75 ohms , sync negative Component*2 (BNC type x3)*3 60i system: Y: 1.0 Vp-p, 75 ohms , sync negative R-Y: 0.7 Vp-p, 75 ohms , (75% color bars) B-Y: 0.7 Vp-p, 75 ohms , (75% color bars) 50i system: Y: 1.0 Vp-p, 75 ohms , sync negative R-Y: 0.7 Vp-p, 75 ohms , (100% color bars) B-Y: 0.7 Vp-p, 75 ohms , (100% color bars) Composite*2 (BNC type x2, loop-through connection)*3 1.0 Vp-p, 75 ohms , sync negative S-Video*2 (BNC type x2)*3 60i system: Y: 1.0 Vp-p, 75 ohms , sync negative C: 0.286 Vp-p, 75 ohms (at burst level) 50i system: Y: 1.0 Vp-p, 75 ohms , sync negative C: 0.3 Vp-p, 75 ohms (at burst level)

--Audio Input--	
Digital audio	AES/EBU (BNC type x2) Conforms to AES-3id-1995
Analog audio*2	Audio (XLR 3-pin female x2) 60i system: +4/0/-6 dBu high impedance, balanced 50i system: +4/0/-3/-6 dBu, high impedance, balanced

--Video Output--	
Digital video	HD-SDI (BNC type x2) Conforms to Serial Digital Interface (1.485, 1.485/1.001 Gb/s), SMPTE 292M SD-SDI (BNC type x2) 60i system: Conforms to Serial Digital Interface (270 Mb/s), SMPTE 259M 50i system: Conforms to Serial Digital Interface (270 Mb/s), ITU-R BT.656
Analog video	Component (HD) (BNC type x3)*4 Y: 1.0 Vp-p, 75 ohms , sync negative R-Y: 0.7 Vp-p, 75 ohms B-Y: 0.7 Vp-p, 75 ohms Component (SD) (BNC type x3)*4 60i system: Y: 1.0 Vp-p, 75 ohms , sync negative R-Y: 0.7 Vp-p, 75 ohms , (75% color bars) B-Y: 0.7 Vp-p, 75 ohms , (75% color bars) 50i system: Y: 1.0 Vp-p, 75 ohms , sync negative R-Y: 0.7 Vp-p, 75 ohms , (100% color bars) B-Y: 0.7 Vp-p, 75

	ohms , (100% color bars) Composite (BNC type x1)*4 1.0 Vp-p, 75 ohms , sync negative S-Video (BNC type x2)*4 60i system: Y: 1.0 Vp-p, 75 ohms , sync negative C: 0.286 Vp-p, 75 ohms (at burst level) 50i system: Y: 1.0 Vp-p, 75 ohms , sync negative C: 0.3 Vp-p, 75 ohms (at burst level) Monitor video (BNC type x1) Composite, 1.0 Vp-p, 75 ohms , sync negative, with superimposed text information

--Audio Output--	
Digital audio	AES/EBU (BNC type x2) Conforms to AEC-3id-1995
Analogue audio	Audio (XLR 3-pin male x2) 60i system: +4/0/-6 dBu, 600 kohms loading, low impedance balanced 50i system: +4/0/-3/-6 dBu, 600 kohms loading, low impedance, Monitor (RCA pin x1) 60i system: -infinity to -11 dBu ±1 dB (-20 dBFS), 47 kohms , unbalanced 50i system: -infinity to -9 dBu ±1 dB (-18 dBFS), 47 kohms , unbalanced Headphones (JM-60 jack x1) 60i system: -infinity to -13 dBu (-20 dBFS), 8 ohms , unbalanced 50i system: -infinity to -11 dBu (-18 dBFS), 8 ohms , unbalanced
--i.LINK Interface--	i.LINK 6-pin x1*5 IEEE 1394-based

--Time Code Input/Output--	
TC In	BNC type x1 0.5 Vp-p to 18 Vp-p, 3.3 kohms, unbalanced
TC Out	BNC type x1 2.2 Vp-p ±3 dB (when 600 ohms terminated), unbalanced

--Remote--	
RS-422A	D-sub 9-pin (female) x1
Control-S (SIRCS)	Stereo mini jack x1

--General--	
Mass	Approx. 6.9 kg (15 lb 3 oz)
Dimensions (W x H x D)	211x 130 x 420 mm (8 3/8 x 5 1/8 x16 5/8 inches)
Power requirement	AC 100 V to 240 V, 50/60 Hz
Power consumption	Approx. 60 W
Operating temperature	5 °C to 40 °C (41 °F to 104 °F)
Storage temperature	-20 °C to +60 °C (-4 °F to +140 °F)
Operating relative humidity	Less than 80%
Storage relative humidity	Less than 90%

Accessories

Accessories

HVBK-1505

Analogue Input Board

DSRM-10

Remote control unit

RM-280

Editing Controller